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SUMMARY OF TRADE AND TARIFF INFORMATION

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44

Prepared in Terms of the Tariff Schedules of the United States

ASBESTOS AND ASBESTOS PRODUCTS

TSUS Items 518.11 - 518.52

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UNITED STATES INTERNATIONAL TRADE COMMISSION

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FOREWORD

Each Summary of Trade and Tariff Information is part of a series published by the United States International Trade Commission to provide information on conditions of competition between domestic and foreign products. This report, generally covering the period 1976 through 1980, is one of many being published in the current series of summaries.

This series provides comprehensive coverage of product uses, the domestic industry, U.S. consumption, production, and trade, and the competitiveness of U.S. producers in domestic and foreign markets in each commodity area. The summaries are cast in terms of the Tariff Schedules of the United States (TSUS).

The current series will consist of approximately 250 individual reports. The Commission will issue updated statistical tables and industry status reports as appropriate for individual summaries. The overall program will run several years, ultimately covering all items of the TSUS.

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Executive Summary

This summary covers unmanufactured asbestos and manufactured asbestos. Unmanufactured asbestos includes the crude asbestos minerals and the processed and sized fibers of asbestos. Manufactured asbestos includes the intermediate asbestos products such as textiles and consumer or end products, such as asbestos-cement pipe and insulation, and friction material. The summary excludes asbestos footwear, headwear, gloves, and laminated or reinforced plastics.

The United States is the largest market economy consumer of unmanufactured asbestos, consuming about 387,000 short tons in 1980, or 17 percent of the free world's total production. The domestic unmanufactured asbestos industry mines and processes less than 10 percent of domestic consumption. The industry consists of four companies operating mines and mills in California, Vermont, and Arizona.

U.S. producers' shipments of unmanufactured asbestos decreased 30 percent during 1976-80, from 115,000 short tons in 1976 to 80,000 short tons in 1980. Imports of unmanufactured asbestos amounted to 360,000 short tons in 1980, representing approximately 93 percent of U.S. consumption; exports amounted to 53,000 short tons. Because of the lack of domestic ore reserves, imports of unmanufactured asbestos, especially from Canada, are expected to remain a large share of U.S. apparent consumption.

Manufactured asbestos is used by more than 20 major industries in over 2,000 specific applications. The construction and automotive industries are the major users of manufactured asbestos. U.S. producers' shipments of manufactured asbestos increased 36 percent during 1972-77, from $534 million to $726 million. Imports in 1980 of all manufactured asbestos were valued at $33.6 million, and exports 1/ were valued at $76.2 million. Exports of manufactured asbestos are limited due to high transportation costs and foreign market production from domestically owned plants located overseas.

The growth of the domestic asbestos industry is expected to decline during the 1980's, due to mandatory health and environmental laws which will curtail investment in upgrading facilities and the development of satisfactory asbestos substitutes. The following areas which will affect economic developments in the asbestos industry include health, safety, and environmental issues; the higher interest costs on financing municipal construction programs; the declining U.S. automotive market; and the lack of growth in the construction industry.

1/ Includes asbestos products not discussed in this summary.

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Commodity	TSUS/TSUSA item No.
Asbestos, not manufactured, asbestos crudes, fibers, and stucco, and asbestos sand and refuse containing not more than 15 percent by weight of foreign matter:	
Amosite	518.1110
Crocidolite (Blue)	518.1120
Chrysotile:	
Crudes	518.1130
Spinning fibers	518.1140
Other	518.1150
Other	518.1160
Yarn, slivers, roving, wick, rope, cord, cloth, tape, and tubing, of asbestos, or of asbestos and any other spinnable fiber, with or without wire, and articles of any of the foregoing	518.21
Articles in part of asbestos and hydraulic cement:	
Pipes and tubes and fittings therefor	518.41
Other	518.44
Articles not specially provided for, of asbestos	518.51
If certified for use in civil aircraft (see headnote 3, part 6C, schedule 6)	518.52

Note.--For the statutory description, see excerpt from the Tariff Schedules of the United States Annotated (1981) in app. A. A concordance of the Tariff Schedules of the United States (TSUS) items included in this summary with related categories in other production, export, and import nomenclatures is found in app. B.

This summary covers unmanufactured asbestos which includes asbestos crudes, fibers, and stucco, and asbestos sand and refuse containing not more than 15 percent by weight of foreign matter and asbestos fibers. Also covered is manufactured asbestos which includes products made from asbestos, except footwear, headwear, gloves, laminated or reinforced plastics, and certain other articles provided for in schedule 7 of the TSUS. The asbestos mining industry is classified under Standard Industrial Classification (SIC) 1499, which includes miscellaneous nonmetallic minerals not elsewhere classified. The asbestos products industry is classified under SIC 3221, which also includes articles not covered in this summary.

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Unmanufactured asbestos

Asbestos is particularly well suited to many applications which require strength, chemical inertness, mold- and mildew-resistance, and nonflammability. The principal commercial asbestos mineral is chrysotile; the deposits of which are more readily available and its physical and chemical properties more desirable. Chrysotile, which is a hydrous magnesium silicate, constitutes about 95 percent of the current world production of asbestos minerals. Unless otherwise designated, the term "asbestos" in this summary refers to chrysotile. Other commercial asbestos minerals include crocidolite and amosite; those of lesser importance are anthophyllite, actinolite, and tremolite. The physical properties of the principal asbestos minerals are shown in the following tabulation:

Properties	Chrysotile	Amosite	Crocidolite
Tensile strength-------1,000 psi--	150-500	200-350	300-550
Flexibility----------	very good	poor	good
Acid resistance----------	poor	good	good
Lustre----------	silky	vitreous-pearly	silky-dull
Texture----------	soft	coarse	harsh
Density----------gm/cm^3--	2.5	3.2	3.5
Hardness (Mohs) 1/----------	3-4	5.5-6	5.5-6
Heat resistance----------	good	good	good (melts earlier)

1/ Mohs scale of hardness for minerals ranges from 1 for talc to 10 for diamond.

Asbestos occurs in relatively thin veins or fault zones of barren rock and is recovered by both open pit and underground mining methods. The choice of mining method is dependent on the geographic location and physical nature of the deposit. The stages in the life of an asbestos mine are shown in figure 1.

Asbestos is produced in two physical forms, crude and milled. Crude asbestos consists of pieces of hand-selected and hand-cobbed materials 1/, essentially in its native or unfiberized form. Milled asbestos consists of

1/ A method of detaching asbestos fiber from waste rock using a hand hammer.

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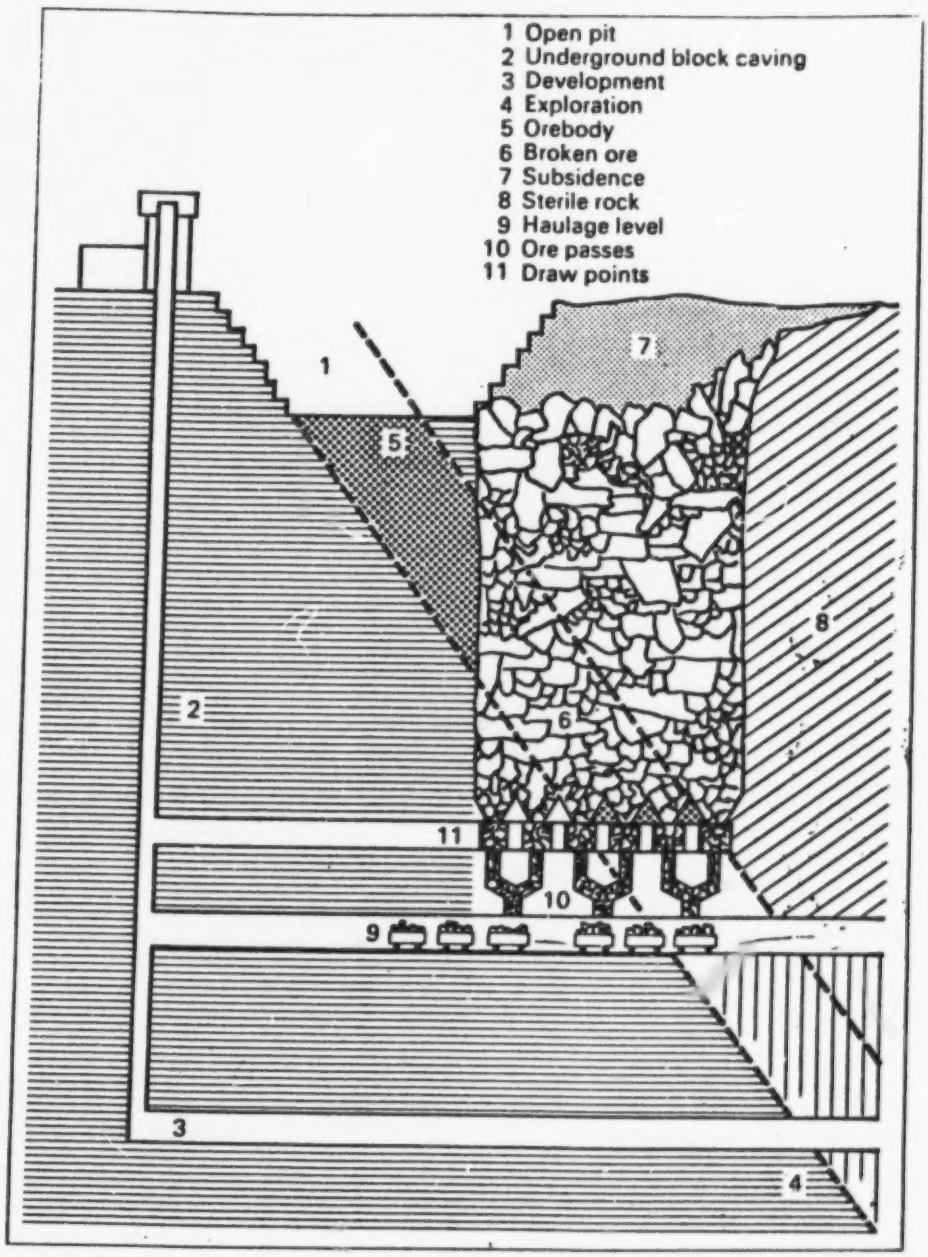
Figure 1.--Various stages in the life of an asbestos mine.



Source: Review, February 1972-CIBA-GEIGY, Ltd.

crushed ore separated from the rock, fiberized and classified by fiber. Throughout the entire process much care is taken to protect the fiber's length. A flowsheet of a typical asbestos mine and operating mill is shown in figure 2.

Unmanufactured asbestos, after being milled, is marketed in product groups composed of varying lengths of processed fiber rather than as a single product. There is no worldwide standard group classification of asbestos; however, major chrysotile-producing countries have adopted the Canadian Quebec-Standard classification system which is based on fiber length groupings (the shorter the fiber, the higher the group number). Fiber grades and their major uses are shown as follows:

Groups	Major use
1, 2, and 3--	Asbestos textiles
4----------	Asbestos-cement pipe
5----------	Asbestos flat and corrugated sheets
6----------	Asbestos gaskets, brake linings
7----------	Molded brake linings, clutch facings and fillers

Manufactured asbestos

Asbestos is used in over 2,000 products with the construction industry being the largest consumer. The following tabulation shows the important end uses for asbestos products covered in this summary, by TSUS numbers:

Product	End use
Asbestos textiles (TSUS item 518.21)	Packing components
	Gasket components
	Roofing materials
	Commercial industrial drying felts
	Heat/fire protective clothing
	Clutch/transmission components
	Electrical wire and pipe insulation
	Theater curtains and fireproof draperies
Asbestos cement products (TSUS items 518.41 and 518.44)	Chemical process piping, water supply piping, electrical conduits
	Hoods, vents for corrosive chemicals
	Chemical tanks and vessels
	Portable construction buildings
	Electrical switchboards and components
	Residential building materials
	Molten metal handling equipment
	Industrial building materials
	Fire protection
	Insulation products
	Small appliance components
	Electrical motor components
	Laboratory furniture
	Cooling towers

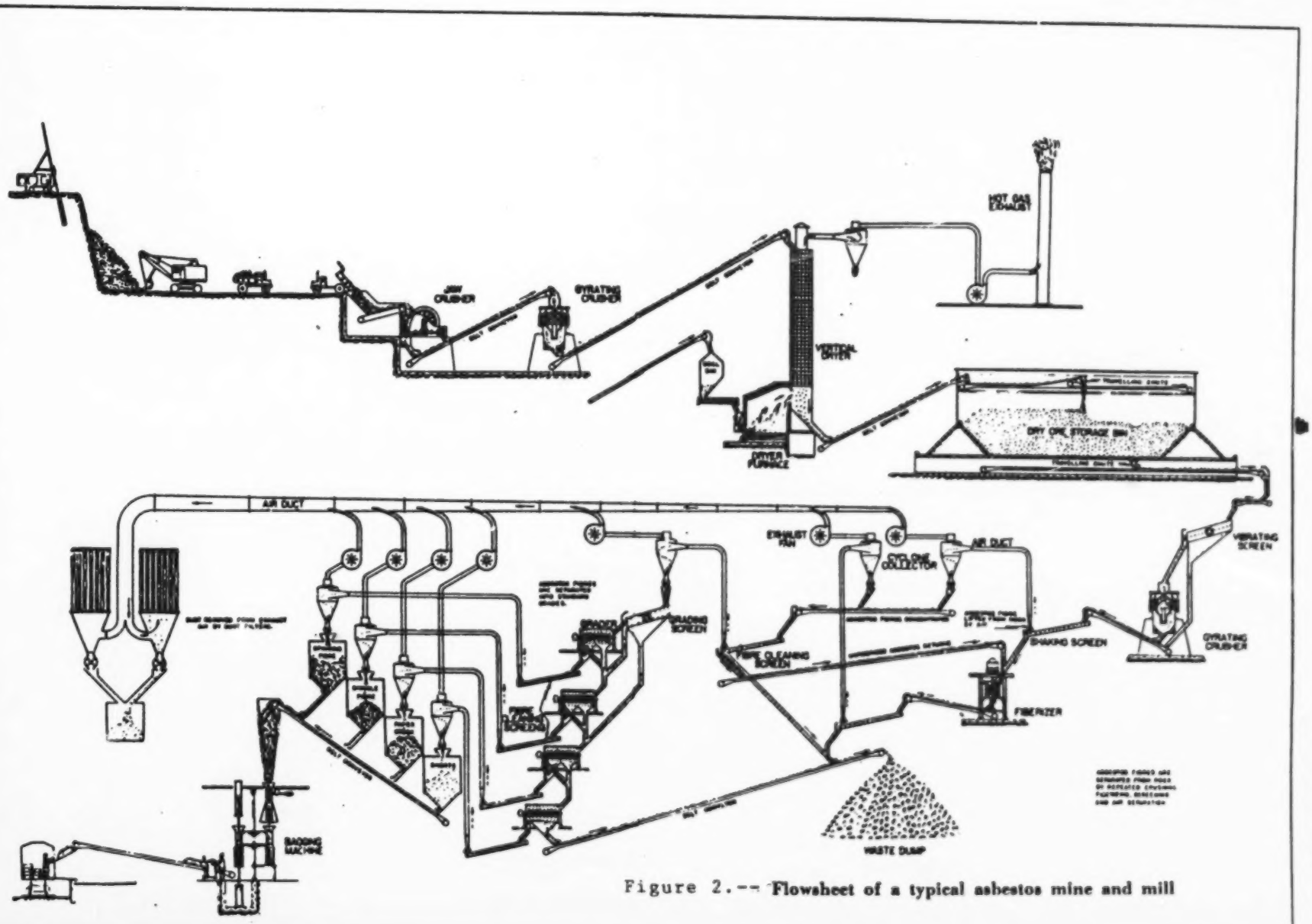


Figure 2.-- Flowsheet of a typical asbestos mine and mill

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Product--Continued	End use
Friction products (TSUS item 518.51)	Clutch, transmission, brake components; industrial friction materials

Asbestos textiles comprise a group of products manufactured similar to most other textiles and described in the TSUS as "yarn, slivers, rovings, wick, rope, cord, cloth, tape, and tubing." 1/ In manufacturing asbestos textile products, asbestos is usually blended with cotton, rayon, or other natural or synthetic organic or inorganic fiber, with the asbestos generally constituting at least 75 percent by weight of the product. Because of the strength and resilience, especially under compression, and suitability in high temperature and corrosive conditions, asbestos textiles are used in packing and gasket products.

Asbestos in combination with portland cement is used in a variety of building materials that have fire and weather resistant properties. When wet, the cement containing from 15 to 25 percent asbestos fiber, is molded into the desired shape; after drying, it is strong, rigid, and durable. One of the most important articles produced from asbestos-cement is pipe. Asbestos-cement (A-C) pipe is primarily used in water distribution and sewer systems (about 70 percent and 20 percent, respectively), and competes principally with polyvinyl chloride (PVC), iron and steel pipe. When A-C pipe is used in sewer systems it also competes with pipe made from vitrified clay and concrete. Asbestos-cement pipe is also used as a conduit for telephone and electrical ducts (nonpressure pipe) and as gas vent pipe.

Asbestos-cement pipe requires only 20 percent of the energy input needed to produce PVC or ductile iron pipe. As the price of petroleum increases, the competitive advantage in the marketplace is greater for asbestos-cement pipe. A-C pipe has an advantage over iron and steel pipe in that it is more resistant to corrosion. The same holds true, to a degree, for other A-C products.

Another important use of asbestos is in friction products. Friction materials are used in practically all industries as a key component in clutches and brakes. Asbestos textiles which traditionally formed the basis for such products are being replaced by molded products containing resins and a lower grade of asbestos fiber.

Customs Treatment

U.S. customs treatment

The following table shows the current rate of duty which applies to asbestos and asbestos products from those countries having most-favored-nation

1/ A glossary of these terms and a listing of asbestos textile products and uses are given in app. C.

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Asbestos and asbestos products: U.S. rates of duty, pre-MTN, present and negotiated, by TSUS items

TSUSA item No.	Description	Pre MTN col. 1 rate of duty 1/	Present col. 1 rate of duty 2/	Negotiated col. 1 rate of duty 3/ (LDDC rate)	Column 2 rate of duty 4/	GSP eligibility
518.11	Asbestos, not manufactured, asbestos crudes, fibers, and stucco, and asbestos sand and refuse containing not more than 15 percent by weight of foreign matter:	Free	Free		Free	
10	Amosite					
20	Crocidolite (blue)					
	Chrysotile:					
30	Crudes					
40	Spinning fibers					
50	Other					
60	Other					
518.21 00	Yarn, slivers, rovings, wick, rope, cord, cloth, tape, and tubing, of asbestos, or of asbestos and any other spinnable fiber, with or without wire, and articles of any of the foregoing.	4% ad val.	3% ad val.	Free	40% ad val.	Yes. 5/
518.41 00	Articles in part of asbestos and hydraulic cement:					
	Pipes and tubes and fittings thereof	0.15¢ per lb.	0.15¢ per lb.		0.75¢ per lb.	Yes. 6/
518.44 00	Other	0.1¢ per lb.	Free	Free	1¢ per lb.	Yes. 5/
518.51 00	Articles not specially provided for, of asbestos.	3.9% ad val.	3.4% ad val.	Free	25% ad val.	Yes. 5/
518.52 00	If certified for use in civil aircraft	6/	Free		25% ad val.	

1/ Effective Jan. 1, 1972-Dec. 31, 1979.
2/ Effective Jan. 1, 1981.
3/ Rate negotiated under the Multilateral Trade Negotiations (Tokyo round), to be achieved through 8 annual staged reductions. This rate is currently applicable to products from countries designated as "least developed developing countries."
4/ Rate provided in Tariff Act of 1930, as amended and modified.
5/ Excluding imports from Mexico, effective March 1, 1978.
6/ Effective Jan. 1, 1980.

status (col. 1) 1/, the future column 1 rates of duty negotiated under the most recent Multilateral Trade Negotiations (MTN) 2/, the rates of duty which apply to imports from countries designated by the President as being under Communist domination or control (col. 2), 3/ LDDC rates of duty 4/ and a reference as to the eligibility for duty-free treatment under the Generalized System of Preferences (GSP). 5/ As of January 1, 1980, Mexico, because it was the source of over 50 percent of the imports of asbestos-cement pipes and tubes into the United States, became ineligible for duty-free treatment under the GSP for TSUS item 518.41.

Foreign customs treatment

With the exception of the United States and Canada, the Customs Cooperation Council Nomenclature (CCCN), formerly the Brussels Tariff Nomenclature, is used as the basis for most countries' tariff classifications. The CCCN classifies asbestos in heading 25.24 and articles under headings 68.12, 68.13, and 68.14.

The present rates of duty and the rates for the major export markets of the United States for asbestos and asbestos products are shown in the following table.

1/ The rates of duty in rate of duty column numbered 1 are Most-Favored-Nation (MFN) rates, and are applicable to imported products from all countries except those Communist countries and areas enumerated in general headnote 3(f) of the TSUS. However, such rates would not apply to products of developing countries which are granted preferential tariff treatment under the GSP or under the "LDDC" rate of duty column.

2/ The most recent (seventh) round of multilateral trade negotiations--referred to as the Tokyo round--was held from 1973 to 1979 under the General Agreement on Tariffs and Trade.

3/ The rates of duty in rate of duty column numbered 2 apply to imported products from those Communist countries and areas enumerated in general headnote 3(f) of the TSUS.

4/ The rates of duty in rate of duty column "LDDC" are preferential rates (reflecting the full U.S. MTN concession rate for a particular item without staging) and are applicable to products of the least developed developing countries designated in general headnote 3(d) of the TSUS which are not granted duty-free treatment under the GSP. If no rate of duty is provided in the "LDDC" column for a particular item, the rate of duty provided in column numbered 1 applies.

5/ The GSP, under title V of the Trade Act of 1974, provides duty-free treatment for specified eligible articles imported directly from designated beneficiary developing countries. GSP, implemented by Executive Order No. 11888 of Nov. 24, 1975, applies to merchandise imported on or after Jan. 1, 1976, and is scheduled to remain in effect until Jan. 4, 1985.

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Country	Description of commodity and foreign tariff item No.	Present rate of duty 1/	Negotiated rate of duty 2/
Canada	Asbestos, crude (31210-1)	Free	
	Asbestos, cloth (31205-1)	12.5% ad val.	8% ad val.
	Yarns, wholly or in part of asbestos, for use in the manufacture of clutch facings and brake linings (31215-1).	7.5% ad val.	5.5% ad val.
	Asbestos in any form other than crude, and all manufactures thereof n.o.p. (31200-1).		
Japan	Asbestos:		
	Not more than 33 yen/kg in customs duty (25.24).	2.5% ad val.	2.1% ad val.
	Other (25.24)	Free	Free
	Articles of asbestos	7.5% ad val.	4.9% ad val.
	Fabricated asbestos and articles thereof (25.24).	7.5% ad val.	4.9% ad val.
	Friction material with a basis of asbestos:		
	Parts of motor vehicles (68.14).	15% ad val.	5.7% ad val.
	Other (68.14)	7.5% ad val.	4.2% ad val.
EEC	Asbestos (25.24)	Free	Free
	Articles of asbestos-cement, of cellulose fibre-cement or the like:		
	A. Building materials	4% ad val.	3.2% ad val.
	B. Other (68.12)	6.5% ad val.	4.6% ad val.
	Fabricated asbestos and articles thereof:		
	A. Fabricated asbestos	8% ad val.	5.3% ad val.
	B. Articles of asbestos:		
	I. Thread	9% ad val.	8% ad val.
	II. Fabrics	11% ad val.	10% ad val.
	III. Other	12% ad val.	6.9% ad val.
	C. Mixtures with a basis of asbestos and mixtures with a basis of asbestos and magnesium carbonate and articles of such mixtures:		
	I. Mixtures	5% ad val.	3.8% ad val.
	II. Articles (68.13)	7% ad val.	4.9% ad val.
	Friction material (68.14)	8% ad val.	5.3% ad val.

1/ Current duty rate applicable to imports from the United States.
2/ Final rates negotiated under the Multilateral Trade Negotiations.

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The U.S. Industry

Unmanufactured asbestos

Asbestos deposits are located in many areas of the United States, but mining was conducted in 1980 only in California, Vermont, and Arizona by four firms. These mines mainly produce a short chrysotile asbestos fiber and have a total capacity of about 135,000 short tons per year. Three of the four producing mines account for 95 percent of the asbestos fiber-ore produced in the United States. All except one of the mines are open pit. The asbestos mines and mills are located close to each other and are owned and operated by the same firm. Economic highlights of the asbestos mining industry are shown in the follow tabulation:

Item	1976	1980	Percentage change, 1980 from 1976
Shipments----------1,000 short tons--	115	80	-30
Value of shipments-------million dollars—	24	31	32
Total employment----------number--	265	250	-6

The mining companies and the asbestos product manufacturers are engaged in research concerned with the controversial health aspects of the fibers. It is probable that many items currently containing asbestos will be replaced due to the development of substitutes spurred by health and environmental concerns. These issues are discussed in more detail later in the summary.

Manufactured asbestos

After mining and milling, asbestos fiber is further fabricated or processed to produce a finished product. About 80 companies operate over 120 establishments to manufacture asbestos products in about 16 States, primarily in the eastern, southern and pacific coast areas. 1/ Several large U.S. firms, which have a controlling interest in foreign asbestos fiber sources, also account for about 40 percent of the American manufactured asbestos production. These plants are characterized by a high degree of specialization and are oriented to serve a specific industry. The U.S. asbestos manufacturing industry is mature and uses well-established technologies. Most of the facilities are over 25 years old. Economic highlights of the asbestos product industry are shown in the following tabulation:

1/ Includes asbestos products not covered by this summary.

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Item	1972	1977	Percentage change, 1977 from 1972
Snipments----------1,000 dollars--	534.2	726.1	36
Total employment-------1,000 workers--	21.0	13.9	-33
Production workers----------do-----	16.6	11.0	-34
Value added----------million dollars--	426.1	439.7	03
Payroll for all employees million dollars--	142.8	136.9	-04

The U.S. asbestos textile industry comprises four firms operating six plants in New Hampshire, North Carolina, Pennsylvania, and South Carolina. One of the firms partly owns an asbestos yarn plant in Venezuela. All of these plants produce a wide variety of textile products.

The asbestos-cement products industry in the United States was established in the late 1920's. In 1980, it consisted of 6 companies operating about 15 plants situated throughout the country.

The U.S. friction material industry, consists of about 39 establishments. Although there are some plants in California, the industry is mainly concentrated in the Midwest and Northeast near their markets. Production processes have remained essentially unchanged.

The U.S. Market

Domestic market profile

The growth outlook over the next 5 years for the automotive and construction industries is positive, with an expected average real growth rate of 3 percent a year. Although the use of the major consuming and industrial areas of asbestos is declining, the expected growth in these industries should maintain the market for asbestos products near the 1980 level, if no further governmental regulations on the production and use of asbestos products are imposed.

Unmanufactured asbestos.--According to the U.S. Bureau of Mines, the demand for unmanufactured asbestos is expected to remain static or to decline slowly from 1978 through 1990. There are active research programs in many industries to develop asbestos substitutes because of the health, safety, and environmental issues. At present there are no wholly satisfactory substitutes available for asbestos in many of its applications.

Manufactured asbestos.--Asbestos in currently being used in more than 20 major industries in over 2,000 industrial applications. The largest industries that use manufactured asbestos are the construction and automotive industries. The economic health of these two industries has a major effect on the fortunes of the asbestos industry. The present economic conditions in both the construction and automotive industries are depressed. The following

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tabulation of new construction put in place in the United States, from 1976 to 1980, shows the growth of construction from 19 percent a year in the early years of this period to a one-half of 1 percent decrease in 1980 from what it was in 1979:

Year	Total new construction (millions of current dollars)
1976	144,494
1977	172,522
1978	205,457
1979	228,950
1980	227,776

The decline in new car sales in 1979 and 1980 coupled with the utilization of less asbestos per automobile will lower the demand for asbestos products.

The enactment of the Clean Air Act by Congress in 1970 has had a substantially negative impact on the domestic asbestos industry. In implementing the Act, the Environmental Protection Agency designated asbestos as a hazardous air pollutant, and in 1972, it prohibited the spraying of asbestos in buildings and ceilings. The effect was to virtually eliminate the use of asbestos as an insulating material in the walls or ceilings of buildings.

Other Government agencies, such as the Occupational Safety and Health Administration (OSHA) and the Food and Product Safety Council, have also made proposals and regulations concerning asbestos mining, manufacturing, and use. These proposals and regulations could further restrict the use of asbestos in the United States.

There has been an ongoing controversy about the effects of asbestos dust on human health. This controversy has been intensified by conflicting reports from industry and Government agencies on the health hazards of asbestos. The U.S. asbestos industry is actively opposing claims by former workers who have contracted diseases allegedly caused by handling asbestos or its products.

Pricing and marketing

Unmanufactured asbestos.--Prices of natural asbestos are regularly published only for Canadian and domestic materials. Producers offering quotations for asbestos to the trade from countries other than Canada and the United States do not publish public prices. Because of its asbestos industry dominance, Canadian prices sometimes influence the pricing schedules of other foreign producers. Pricing of asbestos is based on grades and size of the order sold. Within grades, prices vary according to the predominant fiber length, strength, flexibility, color, chemical composition, and cleanliness.

Manufactured asbestos.--Asbestos textile products are usually sold through distributors. Principal customers for A-C pipe, in order of importance, are contractors, publicly owned users (cities, county water

districts, and public utilities), and distributors. The contractors install the pipe in water and sewage systems. Virtually all A-C pipe sales, except for sales to distributors, are made through competitive bidding with price being the most important factor. Other factors which may help to influence sales are service availability and prior customer acceptance. Cast-iron pipe is more readily accepted by customers on the east coast, while asbestos-cement pipe is preferred on the west coast because of traditional purchasing preference.

U.S. consumption

Unmanufactured asbestos.--U.S. consumption of unmanufactured asbestos decreased sharply during 1976-80, from 727,000 short tons in 1976 to 387,000 short tons in 1980 (table 1). This is mainly due to the slump in the construction and auto industries and the uncertainty related to the health and environmental issues. Imports of unmanufactured asbestos accounted for more than 90 percent or more of domestic consumption each year during this period.

Manufactured asbestos.--Consumption of fiber going into asbestos textiles decreased from 9,700 short tons in 1977 to 3,248 short tons in 1978, then increased to 6,496 short tons in 1979. The future of the asbestos textiles industry is bleak. The two major producers are attempting to eliminate asbestos from their textile products by developing substitutes. Industry sources estimate that 1980 consumption will amount to about 2,000 short tons.

Within the asbestos-cement products group, consumption of A-C pipe increased during the first 9 months of 1979 as Government spending for water and sewer projects increased at record levels. The market for A-C pipe softened during October-December 1979, due to reduced domestic land development and the negative effect of high-interest rates on financing municipal construction programs. These events will probably still affect the A-C pipe industry during the early eighties.

The consumption of asbestos friction products is affected by new car sales. In 1976, a new automobile contained about 1.1 pounds and an average commercial vehicle about 13 pounds of asbestos, mainly in clutch and brake systems. Due to the decline of U.S. motor-vehicle production and the current trend to smaller cars, fewer friction products containing asbestos are being consumed. The introduction of disk brakes, which uses minimal quantities of asbestos also has had a substantially negative impact on the asbestos industry.

The following is a tabulation of U.S. asbestos consumption by end use during 1978 and 1979 in short tons:

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Asbestos	1978	1979	Percentage change, 1979 from 1978
Asbestos-cement pipe	243,488	238,672	-2
Asbestos-cement sheet	40,432	12,208	-7
Flooring products	141,120	134,960	-4
Roofing products	69,552	73,696	6
Packings and gaskets	34,832	21,504	-38
Insulation:			
Thermal	6,944	11,312	63
Electrical	896	5,936	63
Friction products	82,544	68,544	-17
Coatings and compounds	21,392	21,840	2
Plastics	5,488	3,248	-41
Textiles	3,248	6,496	100
Paper	10,080	1,008	-90
Other	27,264	14,336	-47
Total	687,280	613,760	-11

U.S. shipments

Unmanufactured asbestos.--Total shipments of unmanufactured asbestos in the United States during 1976-80 decreased from 115,000 short tons in 1976 to 80,000 tons in 1980 (table 1). Approximately 70 percent of total U.S. shipments came from California, with the remainder from Vermont and Arizona.

Asbestos fiber is shipped in 100-pound bags or in compressed blocks (9 inches x 12 inches x 16 inches). With fiber production limited to a few localities, transportation costs for shipment to asbestos product plants located throughout the country is often a substantial part of the delivered price.

Natural asbestos is on the critical and strategic materials list and is stockpiled by the U.S. Government. The status of the stockpile as of March 31, 1980, is as follows:

Type	Goal	Total inventory	Authorized for disposal	Inventory
	Short tons			Million dollars
Chrysotile	-	9,958	-	8.9
Amosite	26,291	42,534	16,243	22.0

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Manufactured asbestos.--Current annual data are not available on shipments and consumption of manufactured asbestos products. The latest available data as presented in the following tabulation show the growth in the value of shipments of asbestos products in 1977 compared with what it was in 1972:

Product	1972	1977
Asbestos friction materials----------million dollars--	209.5	271.8
Asbestos cement----------do----	208.5	267.3
Asbestos gaskets and packing----do----	46.1	82.0
Asbestos textiles----------do----	37.2	50.3

U.S. imports

Unmanufactured asbestos.--The U.S. asbestos manufacturing industry is dependent on foreign sources for the bulk of its asbestos supply. Canada is the main source of U.S. imports of milled chrysotile asbestos. The Canadian asbestos mines are close to the main U.S. consuming centers along the eastern coast. Several of the leading domestic asbestos manufacturers own and operate extensive asbestos mines in Canada.

From 1976 to 1980, total imports of unmanufactured asbestos declined from a high of 658,000 short tons in 1976 to a low of 360,000 short tons in 1980 (table 2). Lowered imports reflect the decline of activity in the U.S. construction and auto industries, where the bulk of asbestos is consumed. During 1976-80, the value of asbestos imports increased from $142 million in 1976 to $154 million in 1978 due to higher prices rather than greater quantities of imports. The value declined in 1979 and 1980 to a low of $82 million in 1980. The ratio of imports of unmanufactured asbestos to domestic consumption, in terms of quantity, increased annually from 90.5 percent in 1976 to 93.0 percent in 1980.

Imports of chrysotile asbestos in 1980 amounted to 329,000 short tons, over 90 percent of total unmanufactured asbestos. Over 99 percent of these imports came from Canada, with lesser amounts from the Republic of South Africa and Zimbabwe. In addition, small amounts of amosite and crocidolite asbestos were also imported primarily from the Republic of South Africa.

Manufactured asbestos.--Total imports of all asbestos products increased from $20.7 million in 1976 to $32.4 million in 1980. The following tabulation shows U.S. imports, in terms of value, for major asbestos products, 1976-80 (in thousands of dollars):

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Item	1976	1977	1978	1979	1980
Asbestos textiles	10,503	16,404	16,114	15,027	12,609
Asbestos-cement products	4,118	9,606	10,996	11,614	14,045
Other asbestos articles	6,095	5,856	7,266	6,173	5,829
Total	20,716	31,866	34,376	32,814	32,483

Over 90 percent of the manufactured articles are made from imported asbestos fibers.

Imports of asbestos textiles increased from 7.6 million pounds in 1976 to a high of 11.4 million pounds in 1977 (table 3). Since 1977, imports fell each year and totaled 7.5 million pounds in 1980. Over half of the total quantity of imports came from Canada, and Mexico. A large part of the imports from Mexico are from a U.S. manufacturer's affiliated plant. Imports, in terms of quantity, from Canada have been increasing every year since 1977, largely because a leading U.S. firm shifted part of its operations to a Canadian plant. Most of the increased imports from this Canadian plant were for captive use.

The low value-to-weight ratio of asbestos-cement articles makes transportation a significant factor in the delivered cost. The bulk of imports are generally restricted to border trade from Canada and Mexico (table 4). Imports of asbestos-cement pipes totaled 30.0 million pounds in 1976 and decreased to 11.1 million pounds in 1980. About 80 percent of the imports in 1980 came from Mexico which mainly serviced the southwest area of the United States. The remainder of the imports came from Canada, France, Taiwan, and West Germany. Imports of asbestos-cement articles, n.s.p.f., during 1980 totaled 66.1 million pounds. Of this figure, 55 million pounds were from Canada. Mexico and Belgium accounted for most of the "other" cement article imports.

Various items are imported under asbestos articles, n.s.p.f. (TSUS item 518.51), such as asbestos friction products, asbestos sheet and shapes, and compressed asbestos packing. Annual imports of these articles during 1976-80 averaged $6.2 million (table 5). About 75 percent of the import shipments came from Canada, the United Kingdom, and Japan.

Imports under the Generalized System of Preferences.--Imports of asbestos textiles, pipes and tubes of asbestos cement, and articles, n.s.p.f., of asbestos are eligible for duty-free treatment under the GSP. Prior to 1980, articles, n.s.p.f., of asbestos cement had GSP duty-free treatment. As of January 1, 1980, items under this TSUS item became duty-free.

Asbestos-cement pipes and tubes from Mexico are not eligible for GSP treatment because of the competitive-need limitations of the Trade Act of

1974. 1/ There were no imports of asbestos-cement pipe from other GSP countries during the period 1977 to 1980 except for a small shipment from Taiwan.

Imports of asbestos textiles that have received GSP treatment have increased from $771,000 in 1977 to $4.9 million in 1980. Imports of articles, n.s.p.f., of asbestos that have received GSP treatment increased from $592,000 in 1977 to $711,000 in 1980. Imports in 1980 of GSP items mainly came from Brazil.

The International Market

International market profile

Unmanufactured asbestos.--Commercial asbestos deposits have been found in few world locations. Major occurrences are in the Provinces of Quebec and British Columbia, and the Yukon Territory in Canada; the Ural Mountain area of Russia; and in southern Africa. Less important commercial deposits are found in Ontario and Newfoundland in Canada; in California, Vermont, and Arizona in the United States; Italy; Cyprus; Australia; and Brazil.

Canada is the leading market economy supplier of chrysotile asbestos, accounting for more than 28 percent of world production, with exports accounting for approximately 95 percent of its output each year. Shipments of asbestos in 1980 totaled 1,291,000 short tons, declining from 1,493,000 in 1978. Canadian asbestos ore reserves total about 48 million tons of recoverable fiber.

Provincialization of industry operations by Quebec and health regulations are major problems facing the Canadian industry. The implication of these events is having an effect on U.S.-owned asbestos companies in Canada. In 1979, there were 7 companies operating 11 asbestos mines mainly located in Quebec. An American company operates the largest asbestos mine in the free world in Canada--an open pit, 1 mile in diameter and over 950 feet deep. This mine-mill complex at Asbestos, Quebec has a rated capacity of 720,000 short tons per year of chrysotile asbestos, and accounts for approximately 37 percent and 13 percent, respectively, of current Canadian production and world production of chrysotile asbestos. This is the major source of crude fiber for the American company's manufacturing plants in the United States.

The U.S.S.R. is the world's leading producer and consumer of asbestos. Russian production in 1980 is estimated at over 1.7 million tons with about 75 percent consumed domestically. Exports of unmanufactured asbestos were largely to Eastern bloc countries. Expansion of productive capacity is underway at all locations. The largest mining-milling complex is the

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1/ Title V of the Trade Act of 1974 provides that a country loses GSP eligibility for an article if imports (value) of that article from that country exceed 50 percent of total imports (value) in any calendar year; or if exports of an article (value) from a country are in excess of an amount which bears the same ratio to $25 million as the GNP for the preceding calendar year bears to the GNP for 1974.

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Uralasbest Combine in the Ural Mountains. The Koustani installations in the Republic of Kazakastan are located about 2,500 miles southeast of Moscow and have been in operation since 1965.

The Republic of South Africa is the second market economy producer of asbestos. Crocidolite (Blue) and amosite varieties are produced as well as chrysotile. Annual production has totaled about 390,000 tons of asbestos, of which about 50 percent is crocidolite, 30 percent chrysotile, and 20 percent amosite. The mining area is located in the Transvaal or northern area and the bulk of production is controlled by three different mining groups.

Other areas of the world where asbestos is mined are Australia, Argentina, Brazil, China, Cyprus, Greece, India, Italy, Japan, Switzerland, Taiwan, and Turkey. Production in these countries is small and insignificant and most of the asbestos mined is consumed domestically.

Estimated world asbestos production in 1979 was as follows (in short tons):

USSR	2,766,000	United States	104,000
Canada	1,680,000	South America	134,000
South Africa (including Zimbabwe)	560,000	Australia	78,000
Europe	157,000	Other countries	152,000
China	280,000	Total	5,911,000

Figure 3 shows estimated shares of world asbestos production by principal countries.

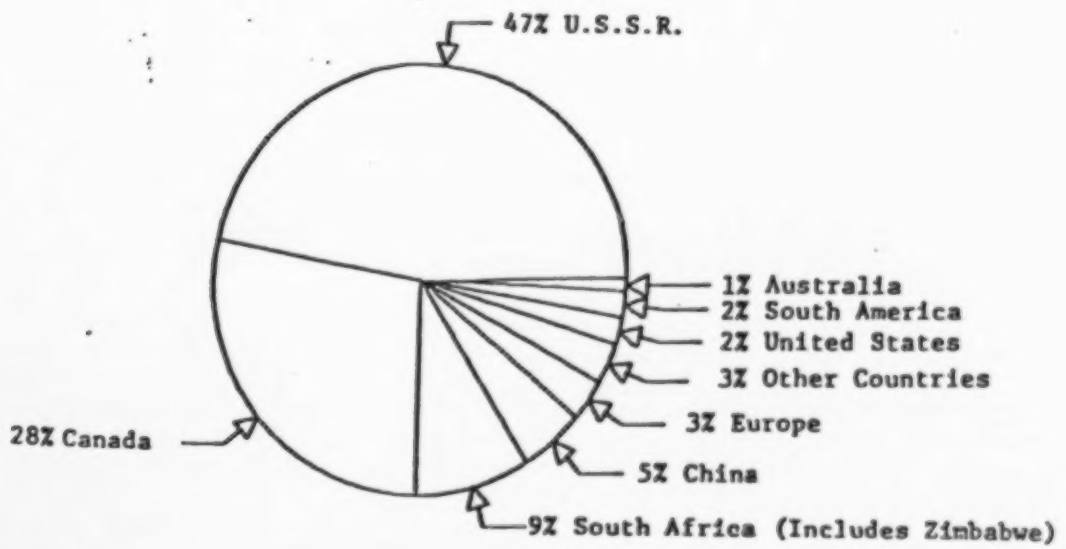

Figure 3.--Estimated World Asbestos Production In Percentage, by countries, 1979.

The world has over 90 million tons of identified asbestos reserves, sufficient to meet industry's needs for the next 50 years. With increasing fiber prices, expansion of existing facilities, discovery of new deposits, and development of techniques to mine previously uneconomic deposits, a continued supply is virtually assured.

In addition to the United States, Western Europe has been another major consumer of asbestos fibers in the free world. The U.S.S.R. is both self-sufficient and the largest consumer of asbestos. In recent years, Japan and the developing countries have become an increasing factor in the consumption of asbestos.

Manufactured asbestos.--A distinctive feature of the world asbestos industry is the high degree of integration, whereby a large proportion of world fiber production is consumed by companies associated with the mining firms. The principal reason for this is the unique nature of the asbestos materials which require special techniques in processing and manufacturing end products. Four major companies mainly are involved in the world's mining, processing, and manufacturing of asbestos: One U.S. company, two English, and one Belgian/Swiss. These four major companies have built asbestos product plants in many areas in conjunction with national governments or local interests. Due to the close producer-consumer relationship of these concerns, there is very limited data published on fiber consumption.

The future for the world asbestos industry does not look promising. It has been predicted that demand will not exceed a growth rate of 1 percent to 2 percent over the next few years. The asbestos industry worldwide faces the same health and environmental problems as the United States. Any new demand for asbestos products will probably come from the developing countries with consumption in the industrial nations likely to remain at current levels.

U.S. exports

Unmanufactured asbestos.--During 1976-80, exports of unmanufactured asbestos have ranged from 37,000 short tons to 56,000 short tons annually (table 1). Japan and Mexico were the major export markets for U.S. unmanufactured asbestos. These exports are not expected to increase due to the lack of extensive domestic reserves.

Manufactured asbestos.--Total U.S. exports of manufactured asbestos products ranged from $60 million to $128 million during 1976-79, and totaled $76 million in 1980 (table 6). U.S. exports of asbestos-cement products are small, compared with domestic production. Due to the bulk and weight of asbestos-cement pipe, coupled with high freight costs, sales of asbestos-cement pipe to export markets are limited. It is believed that in earlier years many export sales were shipments to U.S. installations or to fulfill Agency for International Development contracts. In recent years Saudi Arabia has been the largest foreign market for U.S. asbestos products. These asbestos products are needed in their rapid quest to become an industrial nation. Exports of asbestos-cement products during the years 1978-80 were about $17 million annually. About 18 percent of all asbestos-cement products exported in 1980 were shingles and clapboard. Asbestos textiles exported during 1980 totaled $8.6 million, up from $6.8 million in 1979, about $3.0 million of which went to Mexico and Canada.

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Appendix A

Part 1, Subpart F, Schedule 5, of the Tariff Schedules of the United States Annotated (1981)

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GSP	Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty LDDC	Rates of Duty 2
A	517.81	00	Brushes for electric generators, motors, or other electrical machines or appliances; plates, rods, powder, and other forms, wholly or partly manufactured, for manufacturing into the aforesaid brushes	X	4.7% ad val.	3.7% ad val.	45% ad val.
	517.82	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X	Free		
A	517.91	00	Articles not specially provided for, of carbon or graphite	X	6.9% ad val.	4.9% ad val.	45% ad val.
			Subpart F. - Asbestos and Asbestos Products				
			Subpart F headnote: 1. This subpart does not include footwear, headwear, gloves, laminated or reinforced plastics, and certain other articles provided for in schedule 7.				
	518.11		Asbestos, not manufactured, asbestos crudes, fibers, and stucco, and asbestos sand and refuse containing not more than 15 percent by weight of foreign matter		Free		Free
		10	Amosite	S. ton			
		20	Crocidolite (Blue)	S. ton			
			Chrysotile:				
		30	Crudes	S. ton			
		40	Spinning fibers	S. ton			
		50	Other	S. ton			
		60	Other	S. ton			
A	518.21	00	Yarn, slivers, rovings, wick, rope, cord, cloth, tape, and tubing, of asbestos, or of asbestos and any other spinnable fiber, with or without wire, and articles of any of the foregoing	Lb	3% ad val.	Free	40% ad val.
			Articles in part of asbestos and hydraulic cement:				
A*	518.41	00	Pipes and tubes and fittings therefor	Lb	0.15¢ per lb.		0.75¢ per lb.
	518.44	00	Other	Lb	Free		1¢ per lb.
A	518.51	00	Articles not specially provided for, of asbestos	X	3.4% ad val.	Free	25% ad val.
	518.52	00	If certified for use in civil aircraft (see headnote 3, part 6C, schedule 6)	X	Free		25% ad val.
			Subpart G. - Abrasives and Abrasive Articles				
			Subpart G headnotes: 1. This subpart covers certain crude minerals commonly used for making abrasives and abrasive articles (items 519.01 through 519.17, inclusive) but these minerals are classifiable in this subpart even if they are not of abrasive quality.				

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

Appendix B

Concordance of TSUS numbers, Schedule B numbers, SIC numbers, SITC numbers, and CCCN (BTN) numbers

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Asbestos and asbestos products: TSUS(A) numbers, schedule B numbers, SIC numbers, SITC numbers, and CCCN numbers included in this commodity group

TSUS(A) item No.	Schedule B No.	SIC No.	SITC No.	CCCN No.
518.1110	518.1115 (pt.)	1499 (pt.)	278.4 (pt.)	25.24 (pt.)
518.1120	518.1115 (pt.)	1499 (pt.)	278.4 (pt.)	25.24 (pt.)
518.1130	518.1115 (pt.)	1499 (pt.)	278.4 (pt.)	25.24 (pt.)
518.1140	518.1115 (pt.)	1499 (pt.)	278.4 (pt.)	25.24 (pt.)
518.1150	518.1115 (pt.)	1499 (pt.)	278.4 (pt.)	25.24 (pt.)
518.1160	518.1125	1499 (pt.)	278.4 (pt.)	25.24 (pt.)
518.21	518.2100	3292 (pt.)	663.8 (pt.)	68.13 (pt.)
518.41	518.4230 (pt.)	3292 (pt.)	661.8	68.12 (pt.)
518.44	518.4210	3292 (pt.)	663.8 (pt.)	68.12 (pt.)
	518.4230 (pt.)	3292 (pt.)	663.8 (pt.)	68.12 (pt.)
518.51	518.5110	3292 (pt.)	663.8 (pt.)	68.13 (pt.)
	518.5120	3292 (pt.)	663.8 (pt.)	68.14 (pt.)
	518.5130	3292 (pt.)	663.8 (pt.)	68.14 (pt.)
	518.5180	3292 (pt.)	663.8 (pt.)	68.14 (pt.)
518.52	518.5110	3292 (pt.)	663.8 (pt.)	68.14 (pt.)
	518.5120	3292 (pt.)	663.8 (pt.)	68.14 (pt.)
	518.5130	3292 (pt.)	663.8 (pt.)	68.14 (pt.)
	518.5180	3292 (pt.)	663.8 (pt.)	68.14 (pt.)

Appendix C

Glossary of Asbestos Textile Terminology and Product Uses

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Glossary of Asbestos Textile Terminology and Product Uses

Glossary

Asbestos sliver-	The asbestos fiber mixture is carded to form a loose, bulky, ropelike material known as slivers.
Asbestos roving-	An assemblage of carded fibers rubbed into a single strand without twist.
Asbestos wick-	A twisted product of multiple ends of roving.
Asbestos rope-	A standard product of several ends of wick.
Asbestos cord-	Cord is made from a predetermined number of strands of asbestos yarns tightly twisted together to form a cord of specified diameter and high tensile strength.
Asbestos cloth-	A pliable mineral textile fabric with high tensile strength and high resistance to both heat and chemicals.
Asbestos tape-	A narrow woven fabric of non-metallic and/or metallic yarn with selvage edges.
Asbestos tubing-	A braided or woven tube of asbestos yarn.

Product uses

Asbestos lap-	Insulation for heater cords, fixture wires, and other electrical conductors.
Asbestos roving-	Insulation for heater cords and twisted to form yarn.
Non-woven asbestos felts-	Reinforcement for high and low pressure plastics.
Asbestos yarn-	Woven into textiles.
Asbestos cord-	Insulation for glass handling tools; seals on high temperature metal gaskets; valve stem packings.
Asbestos cloth-	Safety curtains, fire blankets, safety clothing.
Asbestos tubing-	Sleeving for electrical appliance leads and other conductors.
Asbestos wick-	Packings, weather seals.
Asbestos tape-	Electrical insulations.

Appendix D

Statistical Tables

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Table 1.--Unmanufactured asbestos: U.S. producers' shipments, exports of domestic merchandise, imports for consumption, and apparent consumption, 1976-80

(Quantity in thousands of short tons; value in thousands of dollars; unit value per short ton)

Year	Shipments 1/	Exports	Imports	Apparent consumption	Ratio (percent) of imports to consumption
			Quantity		
1976	115	46	658	727	90.5
1977	104	37	607	674	90.1
1978	104	45	628	687	91.4
1979	104	2/ 56	565	613	92.2
1980	80	53	360	387	93.0
			Value		
1976	23,693	12,640	142,145	153,128	92.8
1977	25,627	11,700	145,380	159,307	91.3
1978	27,987	13,090	154,349	169,246	91.2
1979	28,925	16,779	135,210	147,356	91.8
1980	30,599	20,736	81,809	91,672	89.2
			Unit value		
1976	206.30	274.78	216.03	-	-
1977	248.44	316.22	239.57	-	-
1978	263.03	290.89	245.78	-	-
1979	289.25	299.63	239.31	-	-
1980	382.49	391.25	227.25	-	-

1/ U.S. Bureau of Mines.
2/ Statistics adjusted by Commission staff.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Unmanufactured asbestos: U.S. imports for consumption, by principal sources, 1976-80

Source	1976	1977	1978	1979	1980
	Quantity (short tons)				
Canada	617,495	568,876	598,528	546,652	347,823
Republic of South Africa	20,094	22,484	27,456	18,000	11,310
Zimbabwe	3,698	2,796	0	-	1,258
All other	16,564	12,866	2,345	929	389
Total	657,851	607,022	628,329	565,581	360,780
	Value (1,000 dollars)				
Canada	126,863	131,253	134,943	123,673	83,276
Republic of South Africa	9,585	9,536	12,073	11,135	7,203
Zimbabwe	2,307	2,567	0	-	1,227
All other	3,390	2,024	7,333	1,402	103
Total	142,145	145,380	154,349	136,210	91,809

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Because of rounding, figures may not add to the totals shown.

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Table 3.--Manufactured asbestos, asbestos textiles: U.S. imports for consumption, by principal sources, 1976-80

Market	1976	1977	1978	1979	1980
	Quantity (1,000 pounds)				
Mexico	2,755	3,482	2,771	3,124	2,508
Canada	1,367	2,428	2,449	3,015	2,196
United Kingdom	649	972	1,181	793	464
All other	2,847	4,482	3,607	2,616	2,303
Total	7,618	11,364	10,008	9,548	7,471
	Value (1,000 dollars)				
Canada	2,540	3,769	4,152	4,851	3,862
Mexico	3,131	4,326	3,613	4,005	3,304
United Kingdom	1,133	1,689	1,847	1,841	824
All other	3,699	6,710	6,502	4,330	4,619
Total	10,503	16,494	16,114	15,027	12,609

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Because of rounding, figures may not add to the totals shown.

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Table 4.--Manufactured asbestos, asbestos-cement articles: U.S. imports for consumption, by principal sources, 1976-80

Sources	1976	1977	1978	1979	1980
	Quantity (1,000 pounds)				
Canada	11,257	12,250	11,845	35,601	57,835
Mexico	11,446	16,176	21,528	20,793	13,470
Belgium	2,547	3,031	5,160	4,316	4,840
All other	4,794	32,659	24,786	10,525	1,511
Total	30,044	64,116	63,319	71,235	77,656
	Value (1,000 dollars)				
Canada	1,684	2,283	2,440	6,136	10,048
Mexico	1,114	1,679	2,369	2,501	1,932
Belgium	848	1,043	1,536	1,432	1,700
All other	472	4,601	4,645	1,545	365
Total	4,118	9,606	10,990	11,614	14,045

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Because of rounding, figures may not add to the totals shown.

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Table 5.--Manufactured asbestos, asbestos articles, not specially provided for: U.S. imports for consumption, by principal sources, 1976-80

(In thousands of dollars)

Sources	1976	1977	1978	1979	1980
Canada	1,152	1,417	1,914	2,133	2,450
United Kingdom	2,065	1,562	1,946	1,135	951
Japan	1,336	1,356	2,000	1,402	896
All other	1,542	1,521	1,406	1,503	1,632
Total	6,095	5,856	7,266	6,173	5,829

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Because of rounding, figures may not add to the totals shown.

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Table 6.--All asbestos products: U.S. exports of domestic merchandise, by principal markets, 1976-80

(In thousands of dollars)

Market	1976	1977	1978	1979	1980
Saudi Arabia	2,793	11,099	12,620	12,044	11,850
Canada	15,066	23,079	49,263	56,269	6,531
Mexico	2,688	6,318	10,039	11,361	4,611
All other	39,729	38,345	46,919	48,489	53,210
Total	60,276	78,841	118,841	128,163	76,202

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note--Because of rounding, figures may not add to the totals shown.

SUMMARIES OF TRADE AND TARIFF INFORMATION

USITC PUBLICATION 841

COMPLETE LIST OF SUMMARIES PUBLISHED TO DATE IN SCHEDULE 5

Control No.	Publication date	Title
5-3-1	May 1981	Glass Containers
5-2-2	May 1981	Ceramic Floor and Wall Tiles
5-3-3	May 1981	Glass Mirrors

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